



# Decommissioning News.

A newsletter to inform the public about NASA's Decommissioning Activities.

TWENTY-NINTH EDITION. OCTOBER 2009.

## DON'T MISS OUT ON OUR FINAL COMMUNITY INFORMATION SESSION WEDNESDAY, OCTOBER 21. See NASA Yesterday, Today & Tomorrow.

It's a chance to glimpse NASA Plum Brook Station's (PBS) past, present and future. To see how a once state-of-the-art Reactor Facility was built, operated and is being decommissioned. A chance to recall when the Apollo Program landed men on the Moon. It's also an opportunity to look at PBS today and tomorrow, as NASA prepares for Constellation Program testing and considers the possibility of a wind farm at Plum Brook Station.

NASA holds its 11th and final **Community Information Session** (CIS) for the Reactor Facility Decommissioning Project on **Wednesday, October 21, 7 p.m. - 9 p.m.**, at **Sandusky High School**, 2130 Hayes Avenue, Sandusky. Admission is free for the entire family. The CIS will be preceded by a Community Workgroup meeting (5:30 p.m.), also open to the public.

Perhaps your family once lived on farmland now part of PBS. Maybe you remember NASA building the Reactor Facility. Maybe you attended the 1999 PBS Open House, where we introduced the Decommissioning Project to the community - or one of

the Workgroup's 37 meetings since 1999. You'd be amazed how far we've come since then!

This CIS includes a journey back in time through a series of retrospective displays, highlighting progress made this year and this decade. As always, Decommissioning Team members will be on hand to answer questions and offer insights into the challenges faced and the many accomplishments achieved. NASA will also feature staffed displays on upcoming work at PBS active facilities, including plans for a Wind Farm under study. NASA Glenn's Aero Bus will be available for visitors, along with a special Apollo 40th Anniversary display, refreshments and free souvenirs.

According to NASA Glenn Public Affairs Specialist Sally Harrington, "NASA has been part of the Erie County community for more than 50 years and will be for many years to come. But history is made every day at Plum Brook Station. People are welcome to attend the entire event - or just drop by - and share an exciting evening." ▶

## SEEING HOW FAR WE'VE COME WORKGROUP TOURS THE REACTOR FACILITY.



In April 2002, members of NASA's Community Workgroup joined Decommissioning Team members and some NASA retirees on a tour of the Plum Brook Reactor Facility (PBRF). Held a month after the U.S. Nuclear Regulatory Commission (NRC) had approved NASA's Decommissioning Plan, it provided the first public glimpse of PBRF in three decades. Like many parts of Plum Brook Station, PBRF was considered by many NASA neighbors a "mystery behind the fence."

The Workgroup members followed the same stringent safety procedures as NASA and contractors working on decommissioning. They donned radiation badges known as dosimeters, which would show at end of the tour that no radiation exposure occurred. They saw the Containment Vessel (the area housing the dormant reactor), littered with tons of equipment and tools. They also toured the Hot Cell Gallery, an area with robot-like arms once used to reach into seven small rooms, or cells, to analyze the results of reactor experiments. Members also saw the extensive series of air monitors and other safety measures initiated for decommissioning.

Workgroup members were invited back for another tour in September 2004. They viewed a Containment Vessel largely free of equipment and an area where workers used remotely operated tools to remove the reactor's internal components and tank. Then this past July 28, at a final tour, the Workgroup saw none of these things. The reactor tank was now a hole in the ground. The tons of equipment had long since been shipped for disposal and the Hot Cell arms removed, with the cells themselves emptied and decontaminated. What members saw was a collection of buildings stripped to their bare, clean concrete walls; piles of excavated soil; and holes in the ground where structures had been. What they saw was how far the Decommissioning Project has come since their colleagues and predecessors took their first step inside PBRF.

This was the second tour for Workgroup member Bill Ommert. For Rick Myosky, it seemed part of his job, as the Perkins Fire Chief has been on PBRF emergency responder tours. It was the first time for Barbara Berg, Anne Hinton, Ralph Roshong, Tom Surdyk and Lois TerVeen. They were joined by newspaper reporters Tom Jackson (Sandusky Register) and Rick Payerchin (Morning Journal) and their NASA hosts - Decommissioning Program Manager Keith Peecook, Senior Project Engineer Pete Kolb and Radiation Safety Officer Bill Stoner. This tour focused on both the newly started soil work and also included much of the remaining buildings, structures and grounds.

Several Workgroup members had questions and comments, with special interest paid to Soil Assay operations (surveying). Peecook noted that the new system could process up 200,000 pounds an hour. Peecook showed visitors other outdoor operations, including the excavation of Pentolite Ditch. They also saw the former Cold Retention Area (see July 2009 edition), now two large, decontaminated holes with green signs noting the area is ready for Final Status Survey.

The tour moved indoors, where Workgroup members - needing no dosimeters this time - walked through the Hot Pipe Tunnel, which Stoner explained once contained "one of the highest levels of radiation...but has been decontaminated and surveyed." The same was true of the Containment Vessel, where members looked down 25 feet at what had once been water-filled canals - and into the hole that formerly contained the reactor.

Hinton summed up the feelings of the Workgroup when she observed "Keith (Peecook) has done a wonderful job in his reports and use of photos, but seeing (PBRF) helped make it real." She also said the tour "confirms my sense that NASA is committed to doing (decommissioning) in a safe, secure fashion." ▶

# Take a Look at Our Accomplishments This Year and throughout the Decommissioning Project.

## Soil Excavation & Assaying.

During 2009, NASA has been conducting the excavation and assaying (surveying for radiation content) of 100 million pounds of soil from Pentolite Ditch and other areas in and around the Reactor Facility. Since early summer, workers from contractor Clauss Construction have been operating the Orion Soil Assay System (see page 4).



The photo shows a backhoe deposits Pentolite Ditch soil into a dump truck.



The photo above shows a truck depositing soil at the “Lay-down” Area.



The photo above shows soil being moved into the Assay System.



The photo above shows assayed soil being moved on the conveyor belt into the large, clean pile.

Decontamination & Final Status Survey Work.

NASA continued its efforts to decontaminate all surfaces of Reactor Facility buildings and structures, preparing them for Final Status Survey work. Decontamination is now virtually complete in all buildings except for the Containment Vessel in the Reactor Building, where considerable work will take place this winter after soil work is completed.



The photo above shows workers using the Brokk, a remote controlled piece of machinery to remove concrete from the floor of the Hot Pipe Tunnel.



The photo above shows the Hot Pipe Tunnel that was later decontaminated and surveyed. In July, members of the Decommissioning Community Workgroup got a close-up look at the finished work.



The photo above shows workers excavating the Cold Retention Area (CRA). This occurred after the CRA's roof and basin structures had been removed.



The photo above shows a worker with a radiation monitor being lowered into the CRA to conduct the Final Status Survey.

Looking Ahead Plum Brook Station Conducting Wind Farm Studies.

NASA has conducted several studies on developing a Wind Farm at Plum Brook Station (PBS). Federal Executive Order 13423, part of the Energy Policy Act of 2005, calls for a graduated increase in the amount of the electricity NASA uses to come from renewable sources. By 2013, NASA as an agency would be required to derive 7.5 % from renewable sources.

A study by the National Renewable Energy Laboratory (NREL), funded by the U.S. Department of Energy, analyzed the feasibility of alternative energy technologies at PBS, including photovoltaics, wind power, biomass and many applications of solar technology. NREL's Renewable Energy Optimization study looked at available energy resources, technology cost and performance, and federal, state and utility incentives, among other criteria. The study concluded, "Wind power provides the best opportunity for generating large amounts of cost-effective renewable energy."

According to NASA Wind Farm Project Manager Bob Puzak, "We've taken a number of steps regarding the feasibility of a Wind Farm at PBS. Such a facility would enable NASA to meet – and exceed – the upcoming agency-wide requirement." With NREL's conclusion, NASA identified 2,000 acres for producing renewable energy and plans to offer land to an outside developer, who would own, operate and maintain it - in return for NASA's use of the generated electricity. Puzak said any excess power could be offered by the developer to the utility grid so others can meet their renewable energy goals.

NASA is currently studying the environmental and economic viability of the proposed Wind Farm, with Puzak observing "The initial results have been encouraging." The studies include:

**Environmental Assessment (EA)** - Examines the potential for impacts to wildlife, noise, electromagnetic interferences and other factors, and whether any identified impacts can be readily avoided or mitigated. The study was expanded to include potential effects on the migratory habits of birds (to be done by the U.S. Department of Agriculture) and bats. NASA anticipates holding a public comment period and public meeting on the EA next fall.

**Encroachment Study** - Examines possible impacts to surrounding local airports and a potential runway at PBS. Preliminary findings show no impacts.

**Electrical Grid Study** - Reviews permits and compatibility of tying electricity produced by the Wind Farm into the existing electrical grid, for use by other consumers.

NASA recognizes the need to keep the community informed about this exciting initiative. Puzak will provide an update at the Community Workgroup meeting on Wednesday, October 21. ▶



Reactor Segmentation.

From August 2003 through February 2005, NASA conducted segmentation operations, removing all internal components from the reactor and then cutting up the reactor tank. The Class B and C waste from this initiative was carefully packaged and then placed in casks for shipment to the Chem Nuclear disposal facility in Barnwell, South Carolina. Lower level Class A waste from segmentation was sent to the Energy Solutions disposal facility in Utah.



**Before** This photo, taken remotely in 2002, shows the Reactor Core Box a year before segmentation began.



**During** Workers used remote tooling to remove the reactor internals in this 2003 photo.



**After** This 2008 photo shows the Reactor Cavity, where the reactor was located before its segmentation and removal.

Hot Cell Equipment Removal & Decontamination.

From 2001 to 2008, NASA conducted equipment removal and decontamination in the Hot Cells, seven small rooms once used to examine the results of reactor experiments.



**Before** The Hot Cell Gallery is shown in 1968, with a series of robotic arms that allowed workers to conduct experiments remotely.



**During** This photo, from 2001, shows decommissioning workers removing doors from the rear of the Hot Cells.



**After** Workgroup members look at the rear of the Hot Cells, where all decommissioning work is now complete, in this July 2009 photo.

Low-level Radioactive Waste Shipments.

Between 2001 and 2009, NASA has shipped nearly 9 million pounds of Low-level Radioactive Waste (LLRW) to disposal facilities in South Carolina and Utah. In 2003 and 2004, NASA made a total of 6 shipments with the highest levels (from segmentation) to Barnwell, SC. Most LLRW shipments, containing equipment removed from the Reactor Facility and concrete dust from decontamination, have been sent to Energy Solutions in Clive, Utah.



This photo, from 2004, shows a shipment of Class C waste from segmentation on a flatbed truck, headed to Barnwell, SC.



In this January 2009 photo, a front-end loader moves a shipping container aboard a truck bound for Utah. NASA safely shipped a million pounds of Class A LLRW last winter.

## DECOMMISSIONING BY THE NUMBERS.

Soil excavated, project total to date (as of 9/19/09) - 45,000,000 lbs.

Soil shipped, project total to date - 10,000,000 lbs.

### Released for Recycling.

Material	Year to Date	Project Total to Date
Steel	2,000,000 lbs.	5,000,000 lbs.
Concrete	200,000 lbs.	400,000 lbs.
Lead	90,000 lbs.	90,000 lbs.

### LLRW Shipped & Project Total.

Shipped this year to date - 400,000 lbs.

Project total to date - 8,800,000 lbs.

### Number of Structures Demolished & Project Total.

Demolished in 2009 - 5    Total demolished - 21

Total Worker Dose Received - 32.5 person-rem. (since Decommissioning began).

Original Project Dose “budget” - 69 person-rem

(Workers have received less than 1/3 of the expected exposure)

Project Work Hours through 9/19/09 - 1,684,586 hours.

Total Lost Work Day Incidents - 2

(These were both minor injuries: ankle sprain and back strain)

## PROJECT UPDATE Reactor Facility Decommissioning Moves Closer to Completion.

What a difference a decade makes - and what a world of difference over five decades. In 1959, NASA was building the state-of-the-art Plum Brook Reactor Facility (PBRF). It began operating in 1961, testing the effects of radiation on metals to simulate conditions in space. PBRF shut down in January 1973, the result of NASA budget cuts and a change in the Agency’s direction. A small, dedicated crew of workers then spent a year safely removing and shipping the reactor’s fuel and making sure PBRF was carefully retired and put into “safe dry storage.”

While being carefully monitored throughout the years, PBRF would remain in an essentially mothballed state for a quarter century until 1999. Then NASA, at the direction of the U.S. Nuclear Regulatory Agency (NRC), prepared a plan to decommission the facility. When NASA Decommissioning Team members entered PBRF buildings after 25 years, they encountered a scene not unlike something from a science fiction movie: chairs and tables, with tools atop them, as well as large and small pieces of equipment, seemingly suspended in time.

Ten years later, it’s a much different story. The Decommissioning Project is nearly 90% complete. Virtually all of the facility’s buildings and structures stand empty, stripped to their bare, decontaminated, concrete walls. Many await the Final Status Survey (FSS) being conducted to show NASA has met project cleanup levels mandated by the NRC. Some of the structures are no longer standing, having been

decontaminated, surveyed and demolished, including the familiar Double Water Tower that once stood on the 27-acre site. NASA Decommissioning Program Manager Keith Peecook has been on the project since its earliest days, and reflected on both the enormous progress made and the finish line in sight. “We’ve made good on our commitment to make safety our number one priority as we’ve taken apart this facility ...piece by piece by piece,” he observed. “And there have been a lot of pieces – planning for and focusing on each challenge – and accomplishments.”

NASA is now focusing on excavating and assaying (surveying) 100 million pounds of soil from PBRF and adjacent areas. These include Pentolite Ditch, once the permitted pathway for water discharges when the reactor was operational. Workers from contractor Clauss Construction have excavated most of the soil requiring assay work, based on previous surveys. Using backhoes, front end loaders and trucks, they have moved millions of pounds into three piles. The largest, by far, contains little or no radiation. This dirt is run through the Soil Assay System, consisting of conveyor belts equipped with sophisticated monitoring instruments, to confirm that the soil placed on the conveyor belts is clean enough to stay on site.

A much smaller soil pile, containing much lower levels of radiation, is also being assayed, to determine whether it should stay or go. A third pile, the smallest, is being shipped off site. Peecook stated, “We’re very pleased with the assay process. We initially

anticipated about 10% of all soil going off site. But we’ve seen just 5% that needs to be shipped. This means lower costs for NASA and more clean soil for fill at the end of decommissioning.”

Other fall work includes demolishing the former Fan House and Waste Handling Building. Peecook noted that the basement of the latter is being used as a staging area for removing a series of adjacent underground tanks, an innovation that “saves us 10 feet of digging, as well as time and money.” NASA also continues to prepare PBRF buildings for FSS, a task increasing this winter.

Peecook anticipated that all FSS work would be completed in 2011, along with spot cleanup of some off-site areas along Plum Brook - where some miniscule amounts of cesium were discovered in 2005. These tasks will be followed by the formal end of decommissioning: the NRC’s termination of NASA’s reactor license.

NASA will subsequently demolish all remaining buildings to three feet below grade and backfill all holes with clean fill. Before the project ends, all of the former PBRF site will become open space. Peecook said NASA was examining the possibility of restoring some of the 500 acres around the site to their original wetlands state. “NASA has gone the extra mile since day one of this project to ensure the safety of our neighbors, our workers and the environment,” he concluded. “We will continue this approach to the end.” ▶